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WHITEPAPER

Advances in Travel Technology

BY SHRIKANT JAISWAL

This paper discusses ten technologies that are changing the travel industry



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Introduction

The factors impacting traveler behavior are becoming increasingly complex and it's hard to know which specific technologies enable the best combination for a positive travel experience for consumers and profit for travel companies. This white paper provides an expert perspective on how travel companies are engaging in technology for strategic advantage and the services that travelers demand.



Many travelers today have spent their whole adult life in the digital age. They expect information and personalization whenever and wherever they travel.

We address ten innovative technologies that we believe are advancing the travel experience and have included some thoughts on how to understand and navigate the rapidly changing technology – in order to differentiate, secure customer loyalty, and quickly adapt to new business models.

The first five are technologies that are already making the journey simpler and smooth for travelers – but their innovative possibilities have just scratched the surface. Many travelers today have spent their whole adult life in the digital age. They expect information and personalization whenever and wherever they travel. They are always connected and time is a scarce resource.

The five technologies – **Mobile devices, Social Media, Location Based Services, Personalized Marketing (Behavioral Marketing)** and **Near Field Communications** – are beginning to fulfill the expectations that have been touted for a few years. Although some of these technologies are already making an impact – others are just starting to become a common feature of travel. But all of them have the potential to improve the traveler's experience from early research on a destination to choosing a flight, hotel and ground transportation – through to special discount offerings (personalized) at the final destination.

The second five technologies are high on the list of those that deliver greater operational efficiencies to the travel industry. Most are deeply embedded into the fabric of IT– hidden from the traveling public – but absolutely playing an equally important part in the travel industry’s competitive bout.

What is common to all ten technologies? It’s the way digital technology represents a milestone for the travel industry.

The underlying theme for these technologies is the use of open standards – **Service Oriented Architecture (SOA), Business Intelligence (BI), Cloud computing, RFID, Virtualization**. Many of these technologies are connected to each other and are not deployed in isolation. In particular, there are strong synergies between cloud computing, virtualization, and SOA.

What is common to all ten technologies? It’s the way digital technology represents a milestone for the travel industry. They truly cause us to revisit the way travel is conducted and at the same time introduces more efficient processes, governance and workflows.

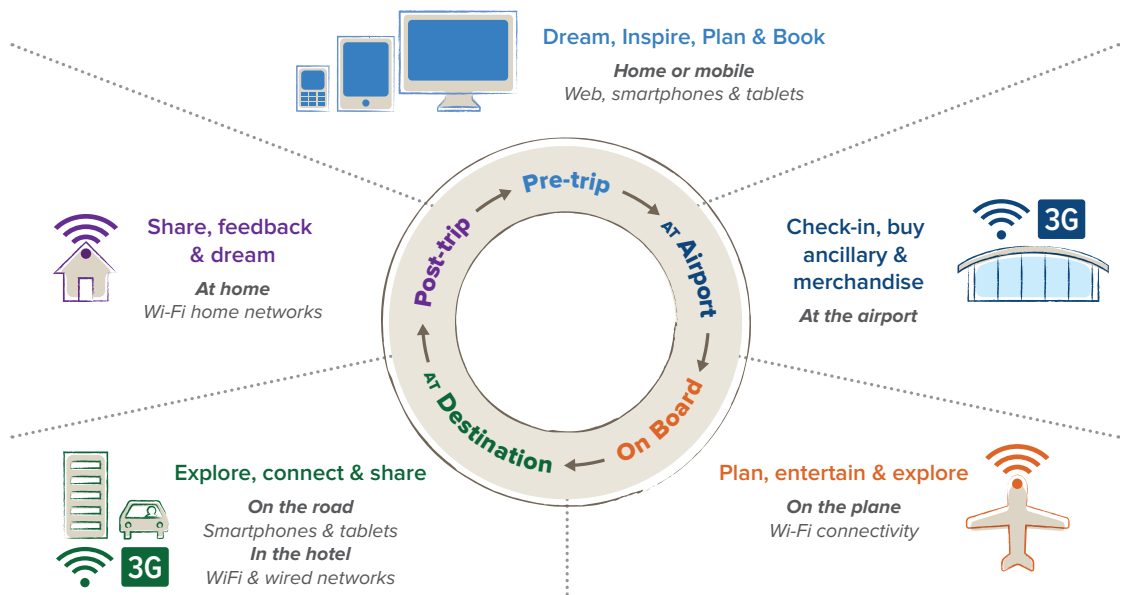
The challenge for the travel industry is to find a cost-effective model that allows it to benefit from these innovations. We look forward to participating in the debate we hope and anticipate this paper will generate.

PART 1 – Five Technologies that are changing travel landscape

MOBILE DEVICES: THE WELL CONNECTED TRAVELER

Market research firm iSuppli Corp., says the number of worldwide subscriptions for wireless services reached 5 billion in September 2010, equaling 73.4 percent of the earth's population¹. And, according to International Data Corporation (IDC) Worldwide Quarterly Mobile Phone Tracker², the worldwide smartphone market grew 79.7% year on year in the first quarter of 2011.

Mobile technology has become an integral part of the travel industry. It has impacted all phases of the travel lifecycle.



It has created two converging trends that will make the business travel a lot less situation-specific and much more “anytime, anywhere”.

First, new mobile devices, smart phones the new tablet PCs are blurring the line between phones and computers – accelerating the acceptance that your mobile device can be the primary access point to online services.

Second, it's the most intimate and flexible way to interact with the traveler, surveys consistently reveal that 90 percent or more of airline passengers carry a mobile device.

Travel companies are leveraging this by deploying new mobile device-based services and applications that give ‘connected’ passengers access to all their travel needs while on the move. It is certain is that mobile will continue to be used to enhance the travel experience.

1. Rebello, Jagdish PHD iSuppli Press Release September 17, 2010 <http://www.isuppli.com/Mobile-and-Wireless-Communications/News/Pages/Global-Wireless-Subscriptions-Reach-5-Billion.aspx>
2. IDC Press Release May 5, 2011 <http://www.idc.com/getdoc.jsp?containerId=prUS22815911>

Airlines

The ability to purchase tickets (mobile ticketing) with a mobile device has gone mainstream. Travel industry experts PhoCusWright reports that 35% of mobile users intend to book travel on their mobile phone in the coming year.

Some specific mobile implementations include:

- Baggage check-in and tracking
- Boarding passes
- Alerts and Notification Services
- Reservation and Related Applications
- Airport Maps

Hotels

Several hotels are beginning to offer check-in services with a Near Field Communication (NFC) enabled mobile phone. We will talk more about NFC in a future section of this paper. For instance, Clarion has started a pilot allowing visitors to check-in and receive their room key without talking to a human being. Provided your smartphone can do the NFC dance, all your information can be remotely downloaded, stored, and wiped (if need be), and you can even check out from a room using the accompanying application.

Some specific applications of mobile technologies for hotels include:

- Updating a hotel booking (add a night, canceling a night etc.)
- Check-In and Check-Out
- Booking or upgrading amenities
- Booking a cab
- Ordering room service
- House keeping for updating room's ready status, checking inventory/ placing orders of housekeeping items, and place room maintenance orders,
- Taking restaurant/ pool side orders using mobile POS device to and transmitting orders to Kitchen

No single technology has more promise than mobile technology for travel industry, as it fulfills the promise of always-on device and always-connected traveler, and provides significant opportunity to provide utility, convenience and superior customer experience.

Most experts predict that mobile communication would be the next technology boom for the travel industry and will have a dramatic impact on the travel experience as well create commercial opportunity. Increased use of mobile device, will lead to increase in mobile ad spending (Projected ad spending \$14.4 Billion 2011).



Take Away / Action Steps

RECOMMENDATIONS FOR PERSONALIZATION / OFFER OPTIMIZATION ADOPTION

- Identify what role mobile should play within traveler's lifecycle to engage customers and improve convenience and user experience.
- Identify what your target customer wants to do with mobile device
- How mobile supports, extends other channels.
- What are the gaps in current communication, interaction with customer
- Evaluate Technology options from two primary strategies for delivering content to your customers over mobile devices:
 - App-centric (specific to device) or
 - Mobile Web-centric (Device Agnostic). The advantage of the web centric is that most mobile browsers can support it, but it depends on a constant connection to the Internet.
- Identify potential applications and evaluate utility and potential usage
- Decide priority to implement mobile platform/ device and OS
- Select development framework and technology such as Flash Vs. HTML5
- Formalize mobile strategy including technology options, development framework, app
- Develop business model, pricing, advertisement on app to support mobile technology
- Collaborate with content providers, advertisers, partners
- Design, develop and test app for usability, branding
- Monitor adoption of mobile app by customers, how many download, and how much usage and adjust strategy/ Roadmap based on monitoring results on usage, feedback.

LOCATION BASED SERVICES (LBS)

Mobile technology is also having a big impact on destination services. Travel suppliers are offering destination-based content which enhances the ability for the traveler to navigate the location.

Based on the JiWire's Mobile Audience Insights Report, mobile consumers under the age of 34 are more eager to share, with 60 percent offering their location for better information. As people become increasingly mobile, they are looking for more relevant content and deals at their fingertips.

While some industry reports indicate sales and promotions are the most popular types of information that mobile consumers are looking for when engaging with location-based services, most cited customer reviews as the location-based information most sought after. The data shows that proximity becomes a key factor for brands to consider when leveraging location-based advertising.

LBS provide a great platform for marketers. We are beginning to see multiple applications such as:

- Virtual Concierge
- Add-on services at the location – tickets for tours, local events, etc.
- Coupons/ deals – sent from the online travel engine to the mobile phone for local deals.
- Check-in services – let your friends know where you are and connect to nearby friend

Opt-in Services, the term “opt -in” refers to messages and services that have been requested by the individual receiving them. This allows creating tailor made services / contents for the traveler, based on predefined preferences.

Travelers should have ability to provide preference, opt-in, as well as control, whether or not they would like to receive messages, and should be able to bypass messages easily.

Contextual aware, another key element of successful LBS is that the system is contextual aware of the relevant information, based on Opt-in information, profile, preferences, itinerary, check-in information, as well as the specific travel needs at the time and at their specific location.

The travel provider, a travel agency, tour operator, or hotelier, could augment travel experience through permission-based marketing messages or promotional coupons.

PERSONALIZATION TECHNOLOGY (BEHAVIORAL MARKETING)

Industry faces challenges of market fragmentation, channel proliferation and consumer control. Management is demanding higher levels of marketing effectiveness for the same marketing dollars.

Industry has collected enough personal information, profile and preference about its customers, so it can personalize the user interface as well present the relevant information to its customer based on profile, preference, buying history to improve the customer experience as well improve the look to book ratio on its site.

Offer optimization technologies promises to dramatically improve the productivity of a marketing expense, by presenting offer (based on user profile, user behavior) which has the high probability of customer accepting the offer.

Many companies are harnessing the power of advanced customer analytics to gain deep understanding of customer, for better marketing outcomes.

Companies need to understand their customers to the point that based on behavioral analysis results, site can deliver appropriate message. There are multiple technologies available such as:

- **Predictive Optimization engine** — Dynamically show your ads to the people who are likely to engage with your campaign and not to ones who aren't. Serve the right message, to the right person, at the right time, based on audience targeting platform it is finally possible to create a dynamic landing pages or personalizing your website.

Similarly another technology which intercept the click stream, create behavioral portrait/ profile based on browsing behavior and then use this information to deliver appropriate marketing message.



Take Away / Action Steps

ROAD MAP FOR MOBILE ADOPTION

- Create small number of behavioral profiles/ portraits of the customer base, based on user behavior based on their click-stream pattern and assign profile to each customer.
- Identify, which offer has the maximum probability of acceptance for each behavioral profiles/ portraits.
- Develop business rules to present offers to target customer profile accordingly.
- Capture results of the offer assignment to compute effectiveness rate based on response received and provide feedback to make adjustments to the offer optimization engine.
- Continue to evaluate the model and add additional profile based on response results, this needs to be adjusted for the channel, as performance is impacted by the channel.

NEAR FIELD COMMUNICATIONS (NFC)

Near Field Communications (NFC) represents a new wave of mobile innovation enabling a wide range of new services for the travel industry. It is a short-range (typically 4 cm or less), high frequency wireless technology that enables simple and fast exchange of data between devices.

Many consider NFC to be the “third wave” in the mobile telephony revolution. The first wave was mobile voice and text communication, the second wave was mobile internet communications. The third wave (with NFC) allows the mobile phone to be used to realize immediate and tangible service transactions at the touch of a handset.

Many smart phones currently on the market already contain embedded NFC chips that can send encrypted data a short distance (“near field”) to a reader located, for instance, next to a retail cash register for making payment.

NFC expands e-commerce opportunities, increases transaction speed and accuracy, while reducing staffing requirements and POS costs.

The technology can be used by reading NFC tag for unlocking doors, making payments and exchanging data, buying metro/ bus tickets, movies, events, as a boarding pass. Tap an Smart Poster tag to see information, listen to an audio clip, watch a video, similarly tapping an NFC tag on a retail display or Smart Poster may give the user a coupon for the product, tap a tag for information or an audio or video presentation at a museum, monument, or retail display much like a QR code.

It is anticipated to become a widely used system for making payments by smart phone in the United States.

The technology is considered intelligent, secure and interactive – which makes it particularly interesting to the travel industry. Passengers usually carry a mobile device and/or frequent flyer card when they travel. Imagine if those devices were NFC enabled – it opens up numerous possibilities to provide electronic services that can simplify and deliver a richer experience to travelers, while reducing the amount of paper and plastic cards that passengers need to carry for their journey.

Major NFC chip makers predict 40 to 50 million NFC phones will be on the market by the end of 2011; however, the recent forecast from Juniper Research³ indicates that “around 52 million consumers will adopt new mobile technologies such as NFC and other physical mobile payment methods to pay for everyday goods and services by 2011”.

There are many innovate use cases for NFC in the travel industry:

- Check-in
- Receive coupons for airport shops
- Pay for goods and services
- Interact with NFC enabled advertisements
- Exchange information with other travelers by bumping phones
- Use the NFC tag on phone for boarding
- Use the phone for public transportation

3. <http://www.juniperresearch.com/reports.php?id=226>

SOCIAL MEDIA

When planning a trip, in the past we used to look for a travel agency and rely on their professional advice to get the best travel package, but things have changed.

Evolution of the travel industry



Web 1.0

Before the advent of the web, planning a trip involved visiting travel agencies, making phone calls and asking friends or friends-of-a-friend for their advice. Travel agencies acted as agents, selling travel-related products and services on behalf of a supplier. They operated on a commission basis, usually receiving a set percentage of their sale. This was the transformation from offline to online bookings.



Web 2.0

With increased general public access to the Internet, travel product suppliers began to sell directly to passengers. Since 1997, travel agencies have gradually been dis-intermediated. As a result, they have developed an Internet presence of their own by creating travel websites, which generally included detailed information and online booking capabilities. This is where travellers are interacting with websites, exchanging ideas with other travelers. It created empowerment that put the advantage from the supplier and intermediary side from pushing in a 1.0 world – now they can share and converse.



Web 3.0

The use of semantic web and metasearch enables travelers to find what they want quickly. For example, some website cut down the information overload and travel planning problems by filtering data according to user preferences and make logical recommendations not only to the travelers themselves, but to their entire social network.

No one can deny the impact of social media in today's travel industry. It has a major impact on all parts of the travel life cycle.

As the hotel traveler has matured, it's no longer about the cheapest room – it's more about the perfect trip.

Around 30% travelers rely on their social media "friends" when planning a trip. Social media has significant impact on travel decisions through specific recommendations, as well as by reviews.

Social media is a "disruptive" technology that facilitates "viral" propagation of information being passed from user to user. Virtual community can spread the word quickly about the business and service that keeps your business top of mind of your fans and lets your fans help you engage new prospective customers. With the popularity of Facebook and Twitter, many social groups that have been created to share information on travel (Groopie, Triphub, Triporama, etc.).

Travel companies spends a substantial amount of money on marketing promotions and advertising, however, word of mouth remains the most powerful influence on consumer behavior.

Engaging in conversation with travelers through new social media channels is critical for strengthening customer relationships, improve customer experience and enhances the brand.

Social media generates enormous amount of data as well as types of data including unstructured data such as tweets, blogs, video clips, e-mails.

Monitoring social media for customer sentiments and responding effectively, is key to one of the marketing tactics to communicate the message, evaluate marketing campaigns, and increase the market share.



Take Away / Action Steps

RECOMMENDATIONS FOR SOCIAL MEDIA INTEGRATION/ ADOPTION

Social media provides immense opportunity to connect with customers, influence customers' behavior by persuasive communication and capitalize on the business insight it generates, to stay ahead of your competition.

Following are specific recommendations business can take up to make effective use of the technology.

- **Create Presence on Social Media**

Create an effective online persona, a social media bio for the business on social media sites.

Craft a short message highlighting services and products. Write a blog to keep your customers updated on services, products, promotions or other important information/ developments or news within the company or industry.

Drive traffic to your website, by building inbound links to your other websites from your social media community page.

- **Engage Customers and Promote Business Using Social Media**

Create a community of fans on social media. Publish useful content, blogs, rich media content and persuasive communications

Create social network apps on mobile devices.

- **Monitor social media conversations to enhance a customer service and develop marketing strategy**

Monitor social media conversation on Facebook, Twitter, or YouTube to take pulse of traveler's desires, wants, needs, sentiments and perceptions. This requires capturing this data from multiple channels.

Develop solutions that capture and analyze a massive amount of social media data and prepare an appropriate, individualized response.

Develop marketing messages, based on business insight from monitoring of customer's conversation/ sentiments.

Continues next page...

- **Convert Unstructured Information into Useful Business Intelligence**

The information created by users in the social platform is a valuable source of business intelligence. Any conversation between its members tells you about your customers experience, sentiments, the market, even your competitors.

Apply effective technology to process massive amount of unstructured data, to listen to the conversations customers are having, filter key marketing signals from noise, analyze those signals.

Use Text Analysis software to convert vast amounts of text-based information to a structured format that lets you process, classify, and summarize data and then integrate that data with broader information

Use Web crawler to extract categorize, and summarize free-form text to identify specific concepts, sentiments, people, organizations, and places.

Create data mining application to analyze customer intelligence to gauge customers' sentiments, feedback on products, brands, and use this insight to develop product, services, pricing, marketing, promotion and campaign.

- **Provide Social Media Intelligence in visual form**

Present the business insight in visual form such as dashboard, for making an appropriate response or whether the level of influence requires a response triggers.

- **Integrate solution with other processes**

The solution need to be integrated with other business software through a unified IT architecture that brings information together across enterprise, e.g. integrates software for analyzing customer sentiment with software for managing customer relationship management (CRM), or you can integrate comments from a social media site into a traveler's loyalty history.

Integrate social media intelligence with marketing processes to respond travelers needs and expectations, manage individualized responses by linking social media ID to travelers ID or service ticket; or link Facebook pages to travelers loyalty programs and other incentives that drive traffic to your Web site, issue coupons or other incentives to dis-satisfied travelers.

PART II – Five advances that will improve travel industry operations

BUSINESS INTELLIGENCE (BI): PULLING IT ALL TOGETHER

The migration of the travel industry to digital technologies is creating an explosion in the amount of data generated. The challenge is to process the information.

Implementation of a business intelligence (BI) platform can provide a competitive edge for travel companies. Some applications include:

- **Market Research** – Enable a thorough analysis of market research to make appropriate decisions about new products, trends and competitive positioning and complete insight into demographics and customer buying behavior
- **Customer Satisfaction Analysis** – Customer Satisfaction Analysis facilitates optimization and streamlining of operations of airlines, agencies, and fleets to achieve optimal customer retention.
- **Customer Churn Analysis** – Churn Analysis evaluates and identifies reasons for customer churn and enables users to quickly and efficiently address issues when targets are not met or when a problem arises, so that the enterprise can combat customer churn.
- **Customer Profitability Management** – Customer Profitability Management and Analysis facilitates excellence in customer service and improves customer acquisition with targeted marketing and market research. Users can identify the most profitable customers and analyze buying behavior and preferences
- **Personalized Marketing (Behavioral Marketing)** –Establish and manage the results of marketing campaigns, market research, sales results and targets, individual sales performance, regional and product sales performance and more.

CLOUD COMPUTING: A SILVER LINING FOR TRAVEL

The phrase ‘cloud computing’ is used to describe the process whereby elements of a company’s computer needs – software applications, processing power or data storage – are provided via the internet as a service rather than through an in-house IT system.

To access most cloud computing services all you need is a web browser. Being browser based takes away the need to be sitting at your desk in the office.

This flexibility makes it an increasingly attractive proposition for the travel industry to use with kiosks and mobile devices.

Proponents of cloud computing argue that it provides a more efficient way of running IT systems. Not only does it dispense with the need to build and manage complicated IT infrastructure, but it allows more to be done with less. There is some evidence for this. Analysis by McKinsey found that 80 percent of computing demand is handled by distributed systems with only 5-30 percent utilization⁴, indicating wastage is high.

4. Source: Revolutionizing Data Center Efficiency – McKinsey & Company

Travel industry For airlines, which are typically heavy users of computer processing power and data storage, it offers a significant opportunity to rationalize their IT facilities.

The cloud computing and its various delivery models such as Software as a Service (SaaS) and Platform as a Service (PaaS) and Infrastructure as a Service (IaaS) has allowed companies to buy technology as a service. This will enable companies to create value through a combination of flexible architecture, cost reduction, speed to market, agility, converting capital expenditure to operating expenditure, lower operational cost and the ability to gracefully integrate business processes with partners and suppliers.

Some of the main features of cloud computing are:

- Broad network access - Available over the network and accessed through standard mechanisms
- Resource pooling /Multi-tenant model
- Resources dynamically assigned and reassigned according to demand.
- Resource provisioning often appear to be unlimited and can be purchased in any quantity at any time.
- Disaster recovery feature built into the service.
- Measured Service - Metered billing/ Pay per usage basis,

New entrant in travel industry will adopt cloud computing model and software as a service (SaaS) to reduce their investment in infrastructure and reduce their time to market

Cloud-based solutions have low barriers to entry. There is small procurement or development lead time; and getting into the cloud is a much faster.

Inevitably there is a lot of hype around cloud computing, and some IT commentators are promoting it as the future of computing within five years. However, there are inhibitors that could slow adoption.

However industry also needs to be aware of the cloud lock-in problem, as getting out of cloud is a lot harder than getting in, especially with SaaS, as vendors have their own styles for implementing data models, metadata, user group administration, security, proprietary scripting and proprietary metadata schemas. So taking all of the data back will require a full IT migration project.



Take Away / Action Steps

RECOMMENDATIONS FOR ADOPTION OF CLOUD COMPUTING

- Develop a cloud strategy using a mix of public and private cloud-based application and platform services.
- Review portfolio of application, data and services which can be moved to cloud, Some of the common applications on cloud for travel, hospitality industry are:
 - Online reservation system/ Booking engine,
 - Inventory management/ Supplier portal
 - Travel contents, video, 360 degree tours,
 - Hosted CRM
 - Hosted data warehouse and Business Intelligence
 - Virtualized hosted desktop management/ Office suites, emails, collaboration tools
- Identify the data which cannot be moved to public clouds, such as credit card information as it requires PCI-DSS compliance requirement for physical control, for such need, a hybrid model of private and public cloud need to be considered.
- Encapsulate functionality in a SOA, convert original code into components accessible via services
- Leveraging Cloud services requires a systems engineering framework with focus on reliability, security, disaster recovery
- Evaluate the impact of cloud lock in implications.

KEY IMPACTS OF CLOUD COMPUTING

- Easier deployment of new/upgraded software to users
- Increased flexibility/scalability to meet peak demands on IT services
- Reduced need to deploy/manage infrastructure
- Deliver consistent & predictable access to the same services worldwide
- Lower capital costs and pay-per-usage schemes
- Access to applications and services while on the move

SERVICE ORIENTED ARCHITECTURE (SOA): DRIVING BUSINESS AGILITY

The use of Service Oriented Architecture (SOA) is on the rise as companies crave more flexibility and better modularity. According to Gartner, SOA will be used in more than 80 percent new mission critical operational applications and business processes designed in 2010⁵.

Traditionally, the travel industry is heavily dependent on mature, relatively expensive core systems such as the CRS and the GDS. The industry has a requirement for a large number of complex integrations with relatively disparate systems. At the same time, the numerous entities involved within the travel industry – airlines, hotels, car rental companies, intermediaries, increase the need for increased interoperability.

SOA facilitates reusability and interoperability both of which are critical in the travel industry. Let's take the example of the booking process for an airline. Very broadly, this process consists of the following – getting the availability, pricing the selected itinerary and completing the reservation. If these three sub functions were built as services, these could be plugged in from various sources such as the airline website, the airline's internal reservations application, a partner site such as a hotel that can access the airlines inventory, a travel agency with access to the airline's inventory or even a corporate that has an agreement with the airline. This ensures consistency across the booking process while allowing flexibility by changing parameters depending on the entity accessing the service.

SOA, if used appropriately and in conjunction with standardization, can help alleviate some of the industry's challenges with respect to integration and interoperability.

KEY IMPACTS OF SOA TECHNOLOGY

- Faster application development
- Software modules re-usable
- Strong synergies with Software-as-a-Service
- Flexible & standardized software architecture
- Eliminates siloed processes
- Common approach to business problems

5. Source: Gartner press release, 25/4/2007 – 'Gartner Says SOA Will Be Used in More Than 50 Percent of New Mission-Critical Operational Applications and Business Processes Designed in 2007'.

VIRTUALIZATION: POWERING THE NEXT GENERATION DATA CENTERS

Virtualization is becoming more than an emerging trend since providers have started focusing on the intelligent design of IT infrastructure and systems.

As the IT of airlines and airports become ever more information centric, the need for sustainable IT infrastructure is growing more acute. This is driving the air transport industry to take a harder look at what virtualization can offer. According to the 2008 Airport IT Trends Survey, 45 percent of airports are looking to virtualization within the next two years, and another 19 percent in the next 3-5 years.

Traditionally, enterprise applications run on servers in data centers. Often it is a one-to-one relationship – one dedicated server for one application: a common setup that has its benefits, but offers little flexibility and can be inefficient as it leaves the majority of each server’s capacity unused. Research by McKinsey found only 6 percent of a server capacity is used on average by those organizations studied, while nearly 30 percent of servers are no longer in use⁶. This means data centers have several times more physical equipment than they actually need.

Virtualization of data centers promises to address these issues by optimizing the use of software, computing hardware and storage, and network infrastructure by sharing server capacity not only across organizations but also across different physical locations.

In effect, virtualization allows physically separate computer systems to act as one. So instead of seven machines running at 10 percent utilization, you can run one machine at 70 percent utilization. This kind of consolidation means savings in hardware should more than offset the cost of the virtualization software. And since there are fewer machines running, there are also savings in power, space, cooling and personnel costs.

Server virtualization is already one of the fastest-growing segments of the IT market. Researcher IDC, for instance, estimates that the number of virtual servers deployed will rise by 41 percent annually through to 2010⁷.

The ability of virtualization technology to free software from the underlying hardware also means it can be easily moved from one server to another in the event of a hardware crash. The system can be programmed to do this automatically even when the server is residing in a completely different location. This makes it particularly useful for rapid disaster recovery.

KEY IMPACTS OF VIRTUALIZATION

- Industry
- Lower capital costs
- Greater optimization of existing IT assets
- Reduced environmental footprint – less CO2 emissions
- Simpler IT management than a distributed environment
- Faster disaster recover potential

A second driver for virtualization within the industry will be its green credentials. By dramatically reducing power consumption and thermal output, while also taking up much less space, it will make a significant, although less visible, contribution to reducing the environmental footprint of air transport. The Director General and CEO of IATA, Giovanni Bisignani, identified it as a key area for investment in a keynote speech at the SITA Air Transport IT Summit in 2008.

A spin-off from server virtualization which has even greater potential will be desktop virtualization. Managing the myriad of distributed PCs and laptops has become highly complex for IT departments. Desktop virtualization should make it easier, as control of each device is managed through an image version stored in a data centers, eliminating the need to physically visit the device.

6. Source: Revolutionizing Data Center Efficiency' – McKinsey & Company
7. Source: IDC press release March 2007

Part III – The right company to help you become a leader in the travel industry

Leading organizations worldwide have made Freeborders their travel technology vendor of choice because of its laser focus on delivering solutions for the travel industry. Freeborders stands out by achieving the following:

- Being an innovator in way to channel the power of today's travel technology
- Creating intuitive, traveler-centric approaches to technology applications
- Using open, modern technologies that support solutions that can be tailored to your specific needs.

Freeborders is infusing travel technology into the way people travel, whereas other vendors are simply adding features that miss the opportunity to transform the way business is done. As you continue your journey toward becoming the best provider of travel services, look to Freeborders to help you make it a success.



ABOUT SHRIKANT JAISWAL

Director

Business Intelligence Technologies

Freeborders offers Shrikant the perfect environment to do what he loves best: striving to redefine excellence. Thriving on Freeborders' fast-paced environment and outstanding client mix, Shrikant is relentless about delivering quality work on time and on budget. He's a great motivator, inspiring software development and support teams to be the best they can be—making him a favorite among Freeborders clients.

Shrikant is a Project Management Professional (PMP) and has over 25 years of experience in planning, leading and delivering IT projects and strategies in travel, insurance, healthcare, and automotive industries. At Freeborders, his primary focus is applying his delivery and industry knowledge to the internet commerce industry.

He has deep experience building large-scale Internet applications, architectures and frameworks. Currently Director of Internet Commerce projects at Freeborders, Shrikant has been with the company since 2008 in various project management and delivery roles. Previously, Shrikant worked with companies such as Cap Gemini, E&Y, and TCSI on Internet technology and business intelligence for enterprise systems.

ABOUT FREEBORDERS

Freeborders is a new generation Consulting and IT services company that enables IT and Business leaders to leverage the power of technology to boost business results.

Privately held and based in San Francisco, CA, Freeborders is recognized for offering best practices in outsourcing by combining its award-winning global delivery model, CHINDUSSM, with its governance model ATLASSM. Freeborders provides a full suite of services that encompass all phases of a project lifecycle including strategy, design, development, testing, implementation integration, and extended support.

Freeborders is rated at Level 5 of the SEI's CMMI, and is ISO 27001 certified.

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